



Forest Health Protection Pacific Southwest Region



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To: Gerald Jones, Regional Forester, Bureau of Indian Affairs, Pacific Regional Office

Subject: Biological evaluation of the Karuk Tribe's Sudden Oak Death proposal to the Bureau of Indian Affairs' Forest Pest Management Program (FHP Report No. N16-09)

Introduction

Lisa Hillman, of the Karuk Tribe Department of Natural Resources (DNR), is submitting a collaborative funding proposal to mitigate the potential impacts of Sudden Oak Death (SOD) on Karuk lands. The Tribe's "**Xunyêp: Mitigating Sudden Oak Death Project**" would go a long way to augment the DNR's capacity to perform strategic education, planning, monitoring, and pilot implementation around issues directly related to SOD. The proposal takes a collaborative approach, employing the input and resources of the Karuk Tribe, the Bureau of Indian Affairs, the Western Klamath Restoration Partnership (WKRP), the Mid Klamath Watershed Council (MKWC), the Salmon River Restoration Council, together with the US Forest Service, and the University of California Cooperative Extension. This biological evaluation serves to provide focus and support for the tribe's proposal.

Background- Pathogen Distribution, Detection and Spread in California

SOD is a problem caused by the pathogen *Phytophthora ramorum* in some coastal California forests containing tanoak or live oak. Once established in a wildland environment, the pathogen expands its range by wind-driven rain, spreading its inoculum (largely sporangia) to nearby susceptible trees. Only trees within a few meters of already infected trees are likely to receive enough spores to become infected. Spread occurs mainly during warm spring rains. While localized spread is most common, sporangia have been shown to be blown up to 3 miles during large storm events.

P. ramorum is typically introduced into wildland environments through the out-planting of infected nursery stock. The pathogen was first introduced to California forests sometime between 1980 and 1990, in three separate locations near San Francisco Bay (at Big Sur, Santa Cruz County and Mt. Tamalpais). By the time *P. ramorum* was identified as the causal pathogen of Sudden Oak Death in 2000, it had already spread to several hundreds of acres in each of these locations. Although many native California plants were later discovered to host the pathogen with varying degrees of damage, outright mortality

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is most common in tanoak and several red oak species. The discovery that infested California bay laurel leaves produce significant levels of inoculum, which readily infect other nearby plants, was crucial to our understanding of disease spread.

Long-distance spread mostly occurs from the human transport of infected plant material, usually nursery stock. The disease is most prevalent in the central California counties nearest to the initial introductions (between Santa Cruz to Sonoma counties) Between 2000 and 2016, the pathogen has since been discovered in Monterey county (at Big Sur) to the south, and in Mendocino, Humboldt and Trinity counties to the north, as well as near Brookings in Oregon. Currently, the closest infestations to Karuk tribal are at Redwood Valley, which was discovered in 2010, and in Redwood National Park, which was discovered in 2014. Both are approximately 22 air miles from the closest Karuk tribal land.

Discussion

In the absence of human-caused transport, it is unlikely that the pathogen would reach Karuk territory for at least 5-10 years. This gives the Tribe time to plan and prepare. Lisa Hillman's proposal contains a wide range of measures to both stem the speed of and prepare for an introduction of *P. ramorum* to Karuk lands. The measures are divided into 7 main objectives- Project Coordination, Education and Outreach, Traditional Ecological Knowledge (TEK) and Western Science-Based Research, Site Assessment and Monitoring, Rapid Response Plan, Resource Protection and Reporting. All are well thought-out and would provide for an excellent comprehensive program. The total funding request is for \$90,000, with a \$105,000 cost share. Because this level of funding may not be available, it may become important to prioritize particular objectives over others, which could be deferred for later implementation. In Phil Cannon's (Regional Pathologist, US Forest Service Pacific Southwest Region) and my opinion, the two most important items are:

1. Site Assessment and Monitoring. It is critical that the location of any *P. ramorum* introductions on Karuk land be identified as quickly and accurately as possible. Stream monitoring through the deployment of *P. ramorum*-susceptible baits in key locations is currently the best way to do this. Aerial surveys, conducted by US Forest Service Forest Health Protection staff augments the stream monitoring program. The discovery of any stream bait-positives must be immediately followed up with aerial and ground surveys to pinpoint the exact disease locations(s).
2. Education and Outreach. Education and Outreach for the public, Karuk tribal members and Karuk DNR and other staff is critical toward both the prevention of pathogen introductions and the rapid recognition of the disease if it is introduced. The proposal addresses this in several ways, including the planning and scheduling educational workshops (in collaboration with the MKWC Plants Program Coordinator, tribal Cultural Practitioners, UC Davis and UC Cooperative Extension), providing educational materials and guest lectures, producing a tri-

fold brochure on SOD to be distributed to the local community, and through public service announcements and other media outlets.

Following these items, the next most important items are:

3. Rapid Response Plan. Although current projections speculate that it will probably be at least 5-10 years before *P. ramorum* is found on Karuk territory, it is not too early to prepare. In this regard, the tribe proposes to prepare a management action plan that prioritizes the types of management activities for prevention and mitigation measures. Perhaps most important, the action plan incorporates the NEPA/CEQA requirement considerations needed to undergo Environmental Assessment and Environmental Impact Statements, helping to clear the way for the implementation of various mitigation treatments, for both prevention and disease response.
4. Resource Protection. Two activities under this objective are particularly helpful. First is working with federal, state and local partners to improve current enforcement of the SOD quarantine between Humboldt County and Siskiyou Counties and second, to promote new county-wide and tribal ordinances to regulate the sale and transportation of potentially infected nursery stock and soil within Humboldt County. Such measures would help reduce the potential for human-mediated transport of *P. ramorum*. These actions already have the support of the Inter-Tribal Justice Coalition. In the second activity, the Tribe would communicate and work with key partners (WKRP, Klamath River Prescribed Fire Training Exchange (TREX) and the Cultural Burning Network) to coordinate prescribed burning and ensure that it follows proper planning and sanitation procedures that will prevent the introduction and spread of SOD. Last year, over 400-acres of land were treated in this fashion, with an estimated in-kind volunteer match valued at over \$500,000. Lisa reports that this activity is funded for this summer.

Recommendations and Conclusions

The “Xunyêp: Mitigating Sudden Oak Death Project” proposal is a comprehensive, well thought-out proposal that is deserving of support. It would do much to help prevent the introduction of Sudden Oak Death into Karuk land and to address it in the event that it is introduced. That said, my main concern is that the cost of implementing the wide range of proposed activities may make it difficult to fully put into action. Fortunately, because SOD will not reach Karuk territory for several years unless the pathogen is actively moved by humans, there is likely time to delay several actions if funding is an issue. In the discussion section above, I’ve identified several of the items that in my opinion, should have the highest priority if funds are limited. These include most of the actions listed under the objectives- “Site Assessment and Monitoring” and “Education and Outreach”, followed by several of the actions under “Rapid Response Plan” and “Resource Protection.” It is my recommendation that the proposal will be funded, in whole or in part.

If you have any questions regarding this biological evaluation report or need additional assistance, please feel free to contact me at 530-226-2436.

/s/ Pete Angwin

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